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THE LUBRIZOL CORPORATION
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EXAMINER

SHOSHO, CALLIE E

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. Applicants' amendment filed 3/21/07 overcomes all outstanding rejections of record.

The new grounds of rejection set forth below are necessitated by applicants' amendment and thus, the following action is final.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-3, 11, 13-18, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/083020 in view of either Filippini et al. (U.S. 2004/0111957), Mullay et al. (U.S. 2004/0111955), JP 57055995, WO 2002/79353, or EP 242832.

WO 03/083020 discloses combination of fuel and lubricant for an internal combustion engine wherein the lubricant comprises lubricating oil such as natural oil or synthetic oil that possesses phosphorous content below 0.1%, preferably 0.02-0.06%, sulfur content below 0.5%, preferably 0.1-0.4%, and ash content below 1.5% (which includes ashless), dispersant such as polyisobutenyl succinimide, antioxidant, and other additives such as viscosity modifier, corrosion inhibitor, and antiwear agent and wherein the fuel is an emulsified fuel which is a water in oil composition comprising fuel such as hydrocarbon fuel including gasoline or non-hydrocarbon fuel such as methanol, ethanol, diethyl ether, etc. and emulsifiers. It is further disclosed that the internal combustion engine comprises exhaust treatment device that traps NO_x and is equipped with system to re-circulate exhaust gas. It is also disclosed that such combination

results in reduction of emissions such as particulate matter (page 1, lines 9-13, page 3, lines 12-13 and 17-22, page 6, line 12, page 12, lines 5-20, page 12, line 26-page 13, line 9, and page 17, lines 1-11 and 21-23). There is no disclosure in WO 03/083020 of chlorine or chlorine containing compounds and thus, it is clear that the chlorine content of the combination must intrinsically be less than 100 ppm as required in present claim 16.

The difference between WO 03/083020 and the present claimed invention is the requirement in the claims of specific emulsifier utilized in the emulsified fuel.

Fillipini et al., which is drawn to emulsified fuel comprising fuel, water, and nitrogen-free surfactant, i.e. emulsifier, disclose the use of surfactant that is C₉-C₁₁ alkoxy poly(ethoxy)₈ alcohol, C₁₂-C₁₅ alkoxy poly(isoproxy)₂₂₋₂₆ alcohol, oleyl alcohol pentaethoxylate, diglycerol monooleate, diglycerol monostearate, polyglycerol monooleate, polyethylene glycol distearate, polyethylene glycol soya bean oil ester, diglycerol dioleate, diglycerol distearate, polyglycerol dioleate, sorbitan monoisostearate, or polyethoxy glycerol trioleate in order to provide fuel with low nitrogen content and thus, lower NO_x emissions (paragraphs 2, 4-12, 37-38, 44-46, 52-54, and 63-71).

Alternatively, Mullay et al., which is drawn to emulsified fuel, disclose the use of nitrogen-free emulsifier that is C₉-C₁₁ alkoxy poly(ethoxy)₈ alcohol, C₁₂-C₁₅ alkoxy poly(isoproxy)₂₂₋₂₆ alcohol, oleyl alcohol pentaethoxylate, diglycerol monooleate, diglycerol monostearate, polyglycerol monooleate, polyethylene glycol distearate, polyethylene glycol soya bean oil ester, diglycerol dioleate, diglycerol distearate, polyglycerol dioleate, sorbitan monoisostearate, or polyethoxy glycerol trioleate in order to provide fuel with good emulsion

stability that can be produced by low energy process (paragraphs 1, 5, 7-11, 19, 21-23, 66-67, 100-103, and 109-116).

Alternatively, pending translation, it is noted that JP 57055995, which is drawn to emulsified fuel, disclose the use of emulsifier that is polyethylene glycol distearate emulsifier in order to produce emulsified fuel with preserved characteristics and satisfactory corrosion inhibition (abstract).

Alternatively, WO 2002/79353, which is drawn to fuel for internal combustion engine, disclose the use of additive concentrate including glycerol dioleate in order to increase fuel economy and reduce combustion emissions (page 1, lines 9-13, col.2, lines 15-19, col.3, lines 9-14, and col.5, lines 8-15).

Alternatively, pending translation, it is noted that EP 242832 discloses the use of surfactant mixture comprising 1-7 moles ethoxylated of oleyl alcohol in order to emulsify combination of water and fuel and thus, produce clear stable emulsion (abstract).

Given that WO 03/083020 in combination with Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 disclose combination of emulsified fuel and lubricant as presently claimed, it is clear that such combination would intrinsically result in reducing engine emissions as presently claimed.

In light of the motivation for using specific emulsifiers disclosed by Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such emulsifiers in the emulsified fuel of WO 03/083020 in order to produce combination that has low nitrogen content and thus, lower NO_x, or alternatively, has good emulsion stability and is produced by low energy

process, or alternatively, is preserved and does not cause rusting or alternatively, has good fuel economy and reduced combustion emissions, or alternatively, has fuel in stable clear emulsion, and thereby arrive at the claimed invention.

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/083020 in view of either Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 as applied to claims 1-3, 11, 13-18, and 20-21 above, and further in view of either Papay et al. (U.S. 5,652,201) or Kocsis et al. (U.S. 6,310,009).

The difference between WO 03/083020 in view of either Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 and the present claimed invention is the requirement in the claims of specific antioxidant.

WO 03/083020 discloses the use of antioxidant in the lubricant, however, there is no disclosure of specific antioxidant as presently claimed.

Papay et al., which is drawn to lubricating oil for engine, disclose the use of antioxidant such as diphenylamine, 2,6-di-tert-butyl phenol, 4-ethyl-2,6-di-tert-butylphenol, etc. in order to protect the composition from premature degradation in the presence of air (col.40, lines 28-46 and 64).

Alternatively, Kocsis et al., which is drawn to lubricating oil for engines, disclose the use of phosphosulfurized terpenes or sulfurized ester as antioxidant (col.17, lines 20-25).

In light of the disclosures in Papay et al. and Kocsis et al. et al. of specific antioxidant as described above, it therefore would have been obvious to one of ordinary skill in the art to utilize

such antioxidants in the combination of WO 03/083020 in order to prevent premature degradation, and thereby arrive at the claimed invention.

5. Claims 1-7, 9, 11, 13-18, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/97952 in view of either Filippini et al. (U.S. 2004/0111957), Mullay et al. (U.S. 2004/0111955), JP 57055995, WO 2002/79353, or EP 242832 and either WO 02/24842 or Carrick et al. (U.S. 6,583,092).

WO 01/97952 discloses emulsified fuel for a combustion engine. The emulsified fuel comprises water, diesel fuel, and emulsifier wherein the emulsifier includes (i) fuel soluble product made by reacting at least one hydrocarbyl-substituted carboxylic acid acrylating agent with ammonia or amine wherein the hydrocarbyl substituent has 50-500 carbon atoms and Mn of about 70 to about 3000, (ii) ionic or nonionic compound with HLB of 1-30 such as amine oxide, glycol ester, lignin, etc., (iii) mixture of (i) and (ii), (iv) water-soluble compound such as amine salt, ammonium salt, nitrate esters, nitro compound, alkali metal salts, and alkaline earth metal salts, (v) reaction product of polyacidic polymer with fuel soluble reaction product made by reacting at least one hydrocarbyl substituted carboxylic acid acrylating agent with ammonia, amine, or polyamine, and (vi) mixture of (ii) and (v). It is disclosed that the emulsifier comprises a mixture of the product made from the reaction of polyisobutene substituted succinic acid or anhydride with alkanol amine wherein the polyisobutene has Mn of about 1500 to about 3000, the product made from the reaction of hydrocarbon substituted succinic acid or anhydride with alkanol amine wherein the hydrocarbon substituent has about 12 to about 300 carbon atoms, and the product made from the reaction of a polyisobutene-substituted succinic acid or anhydride

with at least alkylene polyamine wherein the polyisobutene group has Mn of about 740 to about 1500. It is further disclosed that the emulsifier comprises (I) first polycarboxylic acrylating agent having hydrocarbon substituent of 20-500 carbon atoms and (II) second polycarboxylic acrylating agent having hydrocarbon substituent of up to about 500 carbon atoms wherein (I) and (II) are linked together by linking group derived from compound having 2 or more primary amino groups, 2 or more secondary amino groups, at least one amino group and at least one secondary amino group, at least 2 hydroxyl groups, or at least one primary or secondary amino group and at least one hydroxyl group with the acrylating agents being reacted with amine. There is also disclosed additives such as surfactants and rust inhibitor. There is also disclosed internal combustion engine comprising the above emulsified fuel wherein the use of the fuel results in the reduction of NO_x and particulate emissions and wherein the engine comprises exhaust after-treatment device that contacts exhaust with particulate filter/trap (col.1, lines 10-14, col.3, lines 5-18, col.5, lines 5-11 and 20-28, col.6, lines 24-30, col.7, lines 19-30, col.8, lines 5-17, col.16, lines 17-20, col.19, lines 14-24, col.29, line 18-col.30, line 12, col.32, lines 2-7, col.33, lines 2-4, col.37, line 7, and col.38, lines 6-16).

The difference between WO 01/97952 and the present claimed invention is the requirement in the claims of (a) lubricant and (b) specific emulsifier utilized in the emulsified fuel.

With respect to difference (a), WO 02/24842, which is drawn to lubricating oil composition that is mixed with fuel composition and used in combustion engine, discloses the use of lubricating oil composition comprising base oil such as mineral oil or poly-alpha-olefin oil, ashless dispersant that is Mannich dispersant or carboxylic dispersant, i.e. prepared by

reacting carboxylic acid acrylating agent such as hydrocarbon substituted succinic acid or anhydride with amino compound, and antioxidant. It is disclosed that the lubricating oil contains 5-25 ppm sulfur and less than 50 ppm other impurities. The motivation for using such lubricant is to extend the required time intervals between oil changes and reducing No_x levels in exhaust gases (page 1, 2nd paragraph, page 4, 2nd and 7th paragraphs, paragraph bridging pages 6-7, page 7, 1st full paragraph, page 8, 1st and 4th paragraphs, page 10, 2nd paragraph, page 11, 1st and 2nd paragraphs, page 14, 1st full paragraphs, page 19, 1st full paragraph, page 22, page 23, 3rd full paragraph, and page 31).

Alternatively, Carrick et al., which is drawn to lubricating oil composition, disclose the use of lubricating oil comprising base oil such as synthetic oil Groups I-V, ashless dispersant such as carboxylic dispersant, amine dispersant, or Mannich dispersant and antioxidant wherein the oil comprises up to 0.01% phosphorus, up to 0.25% sulfur, up to 10 ppm chlorine, and up to about 1.2% ash. The motivation for using such lubricating oil composition is to provide composition with improved high temperature deposit performance, oxidative stability, lead and copper corrosion inhibition, and improved seal compatibility (col.1, lines 11-122, col.3, lines 1 and 17-43, col.3, line 49-col.4, line 15, col.4, lines 35-51, col.15, line 1, col.17, lines 4-14, col.24, lines 5-39 and 65, and col.27, lines 60-65).

With respect to difference (b), Fillipini et al., which is drawn to emulsified fuel comprising fuel, water, and nitrogen-free surfactant, i.e. emulsifier, disclose the use of surfactant that is $\text{C}_9\text{-C}_{11}$ alkoxy poly(ethoxy)₈ alcohol, $\text{C}_{12}\text{-C}_{15}$ alkoxy poly(isoproxy)₂₂₋₂₆ alcohol, oleyl alcohol pentaethoxylate, diglycerol monooleate, diglycerol monostearate, polyglycerol monooleate, polyethylene glycol distearate, polyethylene glycol soya bean oil ester, diglycerol

dioleate, diglycerol distearate, polyglycerol dioleate, sorbitan monoisostearate, or polyethoxy glycerol trioleate in order to provide fuel with low nitrogen content and thus, lower NO_x emissions (paragraphs 2, 4-12, 37-38, 44-46, 52-54, and 63-71).

Alternatively, Mullay et al., which is drawn to emulsified fuel, disclose the use of nitrogen-free emulsifier that is C₉-C₁₁ alkoxy poly(ethoxy)₈ alcohol, C₁₂-C₁₅ alkoxy poly(isoproxy)₂₂₋₂₆ alcohol, oleyl alcohol pentaethoxylate, diglycerol monooleate, diglycerol monostearate, polyglycerol monooleate, polyethylene glycol distearate, polyethylene glycol soya bean oil ester, diglycerol dioleate, diglycerol distearate, polyglycerol dioleate, sorbitan monoisostearate, or polyethoxy glycerol trioleate in order to provide fuel with good emulsion stability that can be produced by low energy process (paragraphs 1, 5, 7-11, 19, 21-23, 66-67, 100-103, and 109-116).

Alternatively, pending translation, it is noted that JP 57055995, which is drawn to emulsified fuel, disclose the use of emulsifier that is polyethylene glycol distearate emulsifier in order to produce emulsified fuel with preserved characteristics and satisfactory corrosion inhibition (abstract).

Alternatively, WO 2002/79353, which is drawn to fuel for internal combustion engine, disclose the use of additive concentrate including glycerol dioleate in order to increase fuel economy and reduce combustion emissions (page 1, lines 9-13, col.2, lines 15-19, col.3, lines 9-14, and col.5, lines 8-15).

Alternatively, pending translation, it is noted that EP 242832 discloses the use of surfactant mixture comprising 1-7 moles ethoxylated of oleyl alcohol in order to emulsify combination of water and fuel and thus, produce clear stable emulsion (abstract).

Given that WO 01/97952 in combination with Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 disclose combination of emulsified fuel and lubricant as presently claimed, it is clear that such combination would intrinsically result in reducing engine emissions as presently claimed.

In light of the motivation for using lubricant disclosed by WO 02/24842 or Carrick et al. as described above and for using specific emulsifiers disclosed by Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such lubricant and emulsifiers in WO 01/97952 in order to produce combination of emulsified fuel and lubricant wherein either the combination has extended time intervals between oil changes and reduced NO_x levels in exhaust gases, or alternatively, the combination has improved high temperature deposit performance, oxidative stability, lead and copper corrosion inhibition, and improved seal compatibility and in order to produce combination that has low nitrogen content and thus, lower NO_x , or alternatively, has good emulsion stability and is produced by low energy process, or alternatively, is preserved and does not cause rusting or alternatively, has good fuel economy and reduced combustion emissions, or alternatively, has fuel in stable clear emulsion, and thereby arrive at the claimed invention.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/97952 in view of either Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 and either WO 02/24842 or Carrick et al. as applied to claims 1-7, 9, 11, 13-18, and 20-21 above, and further in view of either Papay et al. (U.S. 5,652,201) or Kocsis et al. (U.S. 6,310,009).

The difference between WO 01/97952 in view of either Filippini et al., Mullay et al., JP 57055995, WO 2002/79353, or EP 242832 and either WO 02/24842 or Carrick et al. and the present claimed invention is the requirement in the claims of specific antioxidant.

WO 01/97952 discloses the use of antioxidant in the lubricant, however, there is no disclosure of specific antioxidant as presently claimed.

Papay et al., which is drawn to lubricating oil for engine, disclose the use of antioxidant such as diphenylamine, 2,6-di-tert-butyl phenol, 4-ethyl-2,6-di-tert-butylphenol, etc. in order to protect the composition from premature degradation in the presence of air (col.40, lines 28-46 and 64).

Alternatively, Kocsis et al., which is drawn to lubricating oil for engines, disclose the use of phosphosulfurized terpenes or sulfurized ester as antioxidant (col.17, lines 20-25).

In light of the disclosures of Papay et al. and Kocsis et al. et al. of specific antioxidant as described above, it therefore would have been obvious to one of ordinary skill in the art to utilize such antioxidants in the combination of WO 01/97952 in order to prevent premature degradation, and thereby arrive at the claimed invention.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

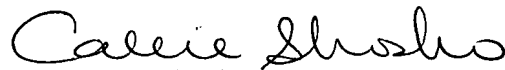
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1714

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Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
5/28/07